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Electromagnetic Waves in a Semispace Filled With Plasma

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B006/B063

treated in the present paper: The magnetic field is assumed to be parallel to the plasma boundary and perpendicular to the direction of the wave propagation; further, the electric vector is assumed to be polarized parallel to the magnetic field (ordinary wave). In other terms, the plasma in the semispace $x > 0$ is exposed to a steady magnetic field $\vec{H}(x) = \{0, 0, H(x)\}$; and in the plane $x = 0$, $E_x = E_y = 0$ and $E_z = E_z(0,y)e^{-i\omega t}$. It is assumed that the plasma be neutral on the average, that the electromagnetic wave has no effect on the ions, and is only slightly disturbed by the electron component of the plasma; the effect of the magnetic wave field on the plasma may be neglected when compared with that of the electric field and that of the steady magnetic field. The space $x < 0$ is assumed to be free of electrons, and the electrons in $x > 0$ are retained by the steady magnetic field $H(x)$. The magnetic field becomes homogeneous at some distance from $x=0$, and the unperturbed electron distribution function is Maxwellian. Furthermore, it is assumed that the ratio of plasma pressure to magnetic pressure $\mu_o = 2T\omega_o^2/mc^2\omega_H^2 = 8\pi NT/H_o^2 \ll 1$, and the terms of the order of $\mu_o^2$ can therefore be neglected. The field being at

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AUTHORS: Dnestrovskiy, Yu.N., and Kostomarov, D.P.

TITLE: A certain non-linear problem of the theory of electromagnetic waves in plasma

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 10, 1961, 1667 - 1669

TEXT: The authors consider the electromagnetic waves propagated in a magneto-active plasma. The waves are propagated perpendicularly to the external magnetic field $H_0$. $H_0$ is assumed to be homogeneous and the electromagnetic vector polarized along it (ordinary wave). If x-axis is parallel to the direction of propagation and the z-axis parallel to the filed $H_0$, the process is then described by

$$\frac{\partial f}{\partial t} + v \cos \delta \frac{\partial f}{\partial x} \text{[illegible]} \omega_H \frac{\partial f}{\partial \delta} + \frac{e}{m} E(t, x) \frac{\partial f}{\partial u} = 0 \qquad (1)$$

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$$\frac{\partial^2 E}{\partial x^2} - \frac{1}{c^2}\frac{\partial^2 E}{\partial t^2} = \frac{4\pi}{c^2}\frac{\partial j}{\partial t} = \frac{4\pi e}{c^2}\frac{\partial}{\partial t}\int_0^{2\pi} d\delta \int_0^{\infty} v dv \int_{-\infty}^{\infty} uf\, du. \qquad (2)$$

In it v, $\delta$, u - cylindrical coordinates in the velocity space, f = = f(t, x, v, $\delta$, u) - electron distribution function $\omega_H = eH_o/mc$ - the Larmor frequency: $E(t, x) = E_z(t, x)$; $j(t, x) = j_z(t, x)$. The general solution of Eq. (1) is

$$f = f(v, g_2, g_3) \qquad (3)$$

an arbitrary function of $g_1$, $g_2$, $g_3$ (the first integrals of the characteristic system of Eq. (1), where f - an arbitrary positive function of its parameters and integrated over infinite limits in the velocity space and even with respect to $g_3$. If the distribution function depends explicitly on $g_2$ - the plasma is inhomogeneous

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and a stationary current must flow parallel to the y-axis which results in an additional inhomogeneous stationary magnetic field in the z-direction and may be compensated for by the inhomogeneities of the plasma pressure. Thus, from Eqs. (1) and (2) the current in the z-direction may be evaluated as

$$j(t, x) = e\int_0^{2\pi} d\delta \int_0^{\infty} v dv \int_{-\infty}^{\infty} f(v, g_1, g_2)\, u du = \frac{e^2}{m}\int_0^{2\pi} d\delta \int_0^{\infty} \varphi\left(v, x + \frac{v}{\omega_H}\sin\delta\right) v dv \int_{t_0}^{t} E\left[\tau, x + \frac{v}{\omega_H}\sin\delta - \frac{v}{\omega_H}\sin(\delta + \omega_H t - \omega_H \tau)\right] d\tau, \quad (4)$$

where

$$\varphi\left(v, x + \frac{v}{\omega_H}\sin\delta\right) = \int_{-\infty}^{\infty} f\left(v, x + \frac{v}{\omega_H}\sin\delta, u\right) du. \quad (5)$$

From (4) and (2) the linear integro-differential equation



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$$\frac{\partial^2 E}{\partial x^2} - \frac{1}{c^2}\frac{\partial^2 E}{\partial t^2} = \frac{4\pi e^2}{mc^2}\frac{\partial}{\partial t}\int_0^{2\pi} d\delta \int_0^\infty \varphi\left(v, x + \frac{v}{\omega_H}\sin\delta\right) v dv \times$$
$$\times \int_{t_0}^{t} E\left[\tau, x + \frac{v}{\omega_H}\sin\delta - \frac{v}{\omega_H}\sin(\delta + \omega_H t - \omega_H \tau)\right] d\tau. \qquad (6)$$

for the field E(t, x) is obtained, which for the monochromatic wave becomes

$$\frac{d^2 E}{dx^2} + k^2 E = \frac{2\pi e^2}{mc^2} \frac{\frac{\omega}{\omega_H}}{\sin\frac{\omega}{\omega_H}\pi} \int_0^{2\pi} d\delta \int_{\delta-2\pi}^{\delta} e^{i\frac{\omega}{\omega_H}(\alpha-\delta+\pi)} d\alpha \times$$
$$\times \int_0^\infty \varphi\left(v, x + \frac{v}{\omega_H}\sin\delta\right) E\left[x + \frac{v}{\omega_H}(\sin\delta - \sin\alpha)\right] v dv. \qquad (8)$$

Basically Eq. (8) is similar to the corresponding equation of the linearized system. The RHS of Eq. (8) tends to infinity for frequencies ω-multiples of the Larmor frequency $\omega_H$. In this case the



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B109/B212

AUTHORS: Dnestrovskiy, Yu. N., Kostomarov, D. P.

TITLE: Dispersion equation for an ordinary wave traveling in a plasma transversely to an external magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 5, 1961, 1404-1410

TEXT: The properties of the dispersion equation are discussed from the mathematical point of view. If $\omega_H = eH_0/mc$ denotes the Larmor frequency and $\omega_0 = \sqrt{4\pi Ne^2/m}$ the plasma frequency, then the dispersion equation for the ordinary wave is known to have the form

$$D(k,\omega) = k^2 - \frac{\omega^2}{c^2} + \frac{\omega_0^2\omega}{2c^2\omega_H \sin(\pi\omega/\omega_H)} \int_0^{2\pi} \exp\left\{-\frac{Tk^2}{m\omega_H^2}(1-\cos\tau)\right\} \times \times \cos\frac{\omega}{\omega_H}(\tau-\pi)\, d\tau = 0. \quad (1)$$

and, for the dimensionless quantities

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$$s = k^2c^2/\omega^2 = N^2, \quad \alpha = \omega/\omega_H, \quad \beta = \omega_0/\omega_H, \quad \gamma = T/mc^2,$$

(where N denotes the index of refraction).

$$\mathcal{D}(s, \alpha, \beta, \gamma) = s - 1 + \frac{\beta^2}{2\alpha \sin \alpha\pi} \int_0^{2\pi} \exp\left(-s\alpha^2\gamma(1 - \cos\tau)\right) \cos\alpha(\tau - \pi)\, d\tau = 0. \quad (2)$$

For $\omega > \omega_0$, $\omega \neq n\omega_H$ (1) always has a pair of real roots $\pm k(\omega)$. Figs. 1 and 2 show the quantitative results; Fig. 1 shows the index of refraction as a function of the frequency at $\beta = \sqrt{0.5}$ for different values of $\gamma$; Fig. 2 shows the same at $\beta = \sqrt{5}$; positive roots are shown above the axis of ordinate, and negative ones below it. For $\omega < \omega_0$ near the resonance frequencies ranges $\overline{\alpha}_n(\beta, \gamma) < \alpha < n$, where (2) has two positive roots. If $\alpha \to n - 0$, one of these roots tends toward zero, and the other toward $+\infty$. Outside these ranges (1) shows no real roots for $\omega < \omega_0$. For $\omega < \omega_0$ there are ranges near the resonance frequencies, where (1) has neither real nor imaginary roots. But (1) has an infinite number of complex root quadruples

$$k = p_n(\omega) \pm iq_n(\omega), \qquad k = -p_n \pm iq_n.$$

for any value of $\omega \neq n\omega_H$. If $\omega$ has to be calculated as a function of real wave numbers k ($\omega = \omega(k)$), then it is necessary to determine the intersections of the lines $N = kc/\omega_H\alpha$ (dotted line in Figs. 1 and 2) with the function $N = \sqrt{s(\alpha, \beta, \gamma)}$ in order to find the real roots of (1). A pair of roots $\omega = \pm\omega_H\alpha^*$ of Eq. (1) corresponds to each point $\alpha^*$, $N^*$. An analysis shows that the number of intersections is infinite. Numbering the abscissae of these points according to their increase ($\alpha < \alpha_2 < \alpha_3 < \ldots$) indicates the following rules: 1) The values of $\alpha_n$ are between $n - 1 < \alpha_n < n$ ($n = 1,2,3, \ldots$); 2) one of the abscissae $\alpha_{n_o}$ is located close to the abscissa of the intersection of the lines $N = kc/\omega_H\alpha$ and $N = \sqrt{1 - \beta^2/\alpha^2}$, i.e., $\alpha_{n_o} \approx \sqrt{\beta^2 + (kc/\omega_H)^2}$; 3) for $1 \leqslant n \leqslant n_o$ one has $\alpha_n \approx n$, and for $n_o < n < \infty$ $\alpha_n \approx n - 1$. While Eq. (1) will have an infinite number of pairs of real roots $\pm\omega_n(k)$ at any real value of k, there are no complex roots. The author thanks A. A. Chechina for helping with the calculations.

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Dispersion equation for an ordinary ... S/056/61/040/005/013/019
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There are 2 figures and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: December 3, 1960

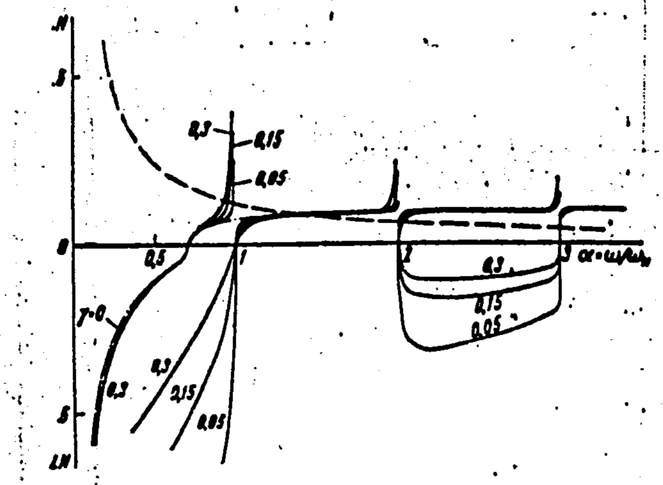


Fig. 1.

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AUTHORS: Dnestrovskiy, Yu. N., Kostomarov, D.P.

TITLE: The dispersion relation for an extraordinary wave propagating in a plasma transversely to an external magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1527 - 1535

TEXT: In a previous paper (ZhETF, 40, 1494, 1961) the authors have investigated the ordinary wave propagating in an unbounded homogeneous plasma. In the present paper, analogous calculations are carried out for the extraordinary and the plasma waves. For these waves the electric vector is polarized perpendicularly to the strength $\vec{H}_0$ of the external magnetic field. The dispersion relation which is investigated reads as follows: $D(k,\omega) = k^2\varepsilon_{11}-\omega^2c^{-2}(\varepsilon_{11}\varepsilon_{22}-\varepsilon_{12}\varepsilon_{21}) = 0$ (1), $\varepsilon_{ij}(k,\omega)$ are the tensor components of the dielectric constant. In the nonrelativistic case the unperturbed Maxwellian electron distribution function is used.

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The dispersion relation... S/056/61/041/005/020/038 B102/B108

$\omega_0 = \sqrt{4\pi N_0 e^2/m}$ is the plasma frequency, $\omega_H = eH_0/mc$ the Larmor frequency, $\mu = Tk^2/m\omega_H^2$, T the electron temperature. The usual procedures based upon Eq. (1), e.g., expansions with respect to a parameter which is assumed to be small, lead to considerable difficulties. The analytic functions derived are valid only in a bounded region and do not hold in the vicinity of resonances (e.g. cyclotron resonance). For plasma waves (large $k^2$), $\varepsilon_{11}(k,\omega) = 0$ (5) holds approximately. This corresponds to the assumption that they are purely longitudinal. Since for $T\rightarrow 0$, $k\rightarrow\infty$, and $\mu \gtrsim 1$, any expansions into power series of $\mu$ lead to results with only limited applicability. In the paper of Bernstein (see below) in which, on the basis of (5), the author attempted to prove that around each cyclotron resonance there exists a region which is opaque for plasma waves, a logical error has been made. The authors of the present paper made a detailed and qualitative investigation of Eqs. (1) and (5) with no other simplifying assumptions than those connected with the nonrelativistic case. The frequency ranges in which Eq. (1) has real roots $k = k(\omega)$ are determined. It is shown that for $\omega_H < \omega < \omega^* < \sqrt{\omega_H^2 + \omega_o^2}$, the dispersion relation has a real root $k(\omega)$, to which corresponds a plasma wave that propagates without absorption. Eq. (1) is rewritten by introducing dimensionless parameters. This dispersion equation is solved numerically. The positive roots are determined for the non-resonance region and their behavior is studied in the vicinity of resonances. The frequency dependence of N is investigated for various electron temperatures and plasma densities ($\beta$ = 1, 2, 2.25 and 17.6). The results showed that the roots of Eq. (1) corresponding to plasma waves may be also determined from Eq. (5) in good approximation. Only near the hybrid frequency $\sqrt{\omega_H^2 + \omega_o^2}$ the results are not valid. Besides the real roots, Eq. (1) has an innumerable set of complex roots. The dispersion relation may also be considered as an equation for determining $\omega$ as a function of the wave number k. It is proved that then there exists an innumerable set of real roots $\omega = \omega(k)$ whereas (1) has no complex roots $\omega = \omega(k)$. The authors thank A. A. Chechina for help. There are 3 figures, 2 tables, and 11 references: 8 Soviet and 3 non-Soviet. The three references to the English-language publications read as follows: E. P. Gross, Phys. Rev. 82, 232,

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The dispersion relation...

1951; J. Bernstein. Phys. Rev., 109, 10, 1958; J. E. Drummond. Phys. Rev. 110, 293, 1958.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: May 17, 1961

Card 4/4

S/208/62/002/001/007/016
D299/D303

AUTHORS: Dnestrovskiy, Yu.N., and Kostomarov, D.P. (Moscow)

TITLE: Propagation of electromagnetic waves in a plasma normal to the external magnetic field

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 2, no. 1, 1962, 97 - 106

TEXT: The propagation of electromagnetic waves in a direction normal to the external magnetic field is considered. The existence and uniqueness of the solution is proved by the method of successive approximations. Thereupon, integral transforms are used for constructing solutions to the problem with initial conditions and the problem on wave excitation by side currents. These solutions show that notwithstanding the presence of complex roots in the corresponding dispersion equation, no energy transfer takes place from the plasma to the electromagnetic field (or conversely) during wave-propagation under steady-state conditions. In the linear approximation, plane-wave propagation in a plasma is described by equations:

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$$\frac{\partial f}{\partial t} + v_x \frac{\partial f}{\partial x} + \frac{e}{mc}[\mathbf{v}, \mathbf{H}_0]\frac{\partial f}{\partial \mathbf{v}} = -\frac{eN_0}{m}\mathbf{E}\frac{\partial f_0}{\partial \mathbf{v}}, \quad (1)$$

$$\mathrm{rot}\,\mathbf{H} = \frac{1}{c}\frac{\partial \mathbf{E}}{\partial t} + \frac{4\pi}{c}\mathbf{j} + \frac{4\pi}{c}\mathbf{j}^{(\text{ст})}, \quad (2)$$

$$\mathrm{rot}\,\mathbf{E} = -\frac{1}{c}\frac{\partial \mathbf{H}}{\partial t}, \quad (3)$$

$$\mathbf{j} = e\int f\mathbf{v}\,d^3v. \quad (4)$$

$H_0$ is a homogeneous magnetic field, normal to the direction of propagation. After computations, the problem reduces to two independent systems of integro-differential equations in the field components. For these two systems, existence- and uniqueness theorems are proved. The proofs are based on the method of successive approximations. This method (besides proving the existence and uniqueness of the solution) permits finding a majorant estimate for the solution and to investigate its behavior at the initial stage of the process. But this method is unsuitable for studying the behavior of the solution at $t \to \infty$ which is of great interest in practice. This can be achieved by the method of integral transforms which

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yields explicit expressions for the solutions. Thereby, it is assumed that the side currents are harmonic functions of time. The first system of integro-differential equations is considered; a Fourier transform (with respect to x) is carried out, and a Laplace transform (for t); the obtained algebraic system of equations is solved, yielding the result:

$$\mathscr{E}_x(\Omega, k) = I_y \frac{2\Omega\varepsilon_{12}(\Omega, k)}{(\Omega-\omega) D_1(\Omega, k)}, \quad \mathscr{E}_y(\Omega, k) = -I_y \frac{2\Omega\varepsilon_{11}(\Omega, k)}{(\Omega-\omega) D_1(\Omega, k)}. \qquad (21)$$

Here $\mathscr{E}_{x,y}$ is the Fourier-Laplace image of the electric-field components:

$$\mathscr{E}_{x,y}(\Omega, k) = \int_0^\infty e^{i\Omega t} dt \frac{1}{2\pi} \int_{-\infty}^{\infty} e^{-ikx} E_{x,y}(t, x)\, dx \qquad (22)$$

$$D_1(\Omega, k) = k^2c^2\varepsilon_{11} - \Omega^2(\varepsilon_{11}\varepsilon_{22} - \varepsilon_{21}\varepsilon_{12}). \qquad (23)$$

The singularities of the functions $\mathscr{E}_x$ and $\mathscr{E}_y$ in the complex plane $\Omega$ are the zeros of the functions $D_1$ and the point $\Omega = \omega$. The

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equation $D_1(\Omega, k) = 0$ is the dispersion equation for the type of waves under consideration (extraordinary wave). By means of Mellin's transform, one obtains the originals from the images (21), viz.:

$$\left\{\begin{matrix} E_x(t,x) \\ E_y(t,x) \end{matrix}\right\} = I_\nu \int\limits_{-\infty}^{\infty} \left[ \left\{\begin{matrix} -\varepsilon_{12}(\omega,k) \\ \varepsilon_{11}(\omega,k) \end{matrix}\right\} \frac{2i\omega e^{i(kx-\omega t)}}{D_1(\omega,k)} + \right.$$

$$\left. + \sum_n \left\{\begin{matrix} -\varepsilon_{12}(\omega_n,k) \\ \varepsilon_{11}(\omega_n,k) \end{matrix}\right\} \frac{2i\omega_n e^{i(kx-\omega_n t)}}{(\omega_n-\omega)\frac{\partial D_1}{\partial\Omega}(\omega_n,k)} \right] dk. \quad (25)$$

Owing to dissipative processes, the free oscillations are damped and the solution for $t \to \infty$ is determined by the side currents only. These forced oscillations are separated by means of the principle of limit absorption. The first terms in Eq. (25) describe purely forced oscillations which determine the electromagnetic field for $t \to \infty$, (steady-state conditions). Thus

$$\left\{\begin{matrix} E_x^{st}(t,x) \\ E_y^{st}(t,x) \end{matrix}\right\} = \lim_{\nu\to 0} I_\nu \int\limits_{-\infty}^{\infty} dk \frac{2i(\omega+i\nu)e^{-i(\omega t-kx)}}{D_1(\omega+i\nu,k)} \left\{\begin{matrix} -\varepsilon_{12}(\omega+i\nu,k) \\ \varepsilon_{11}(\omega+i\nu,k) \end{matrix}\right\}. \quad (26)$$

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By considering the disposition of the roots of Eq. (26), it is found that integral (26) can be computed along the real axis. As a result, the field in the region $x > 0$, is determined as the sum of the residues at the zeros of the function $D_1(\omega, k)$, viz.:

$$E^{st}_{x,y}(t,x) = I_y\Big\{\sum_n \alpha^{(n)}_{x,y} e^{i(k_n x - \omega t)} + \sum_n \beta^{(n)}_{x,y} e^{-i(k_n x + \omega t)} + \\ + \sum_n \gamma^{(n)}_{x,y} e^{-\varkappa_n x - i\omega t} + \sum_n \left(\delta^{(n)}_{x,y} e^{ip_n x} + \delta^{(n)*}_{x,y} e^{-ip_n x}\right) e^{-q_n x - i\omega t}\Big\}, \tag{27}$$

where $\alpha$, $\beta$, $\gamma$ and $\delta$ are constants. The first sum in (27) represents undamped waves with phase velocity directed from the source away, the second sum -- undamped waves with phase velocity towards the source, the 3rd and 4th sums represent exponentially damped solutions and standing waves, respectively. It is noted that (notwithstanding the complex roots), no energy transfer between plasma and electromagnetic field takes place. Further, the dispersion equation $D_2(\Omega, k) = 0$ is derived (for the ordinary wave). The above solutions were constructed on the assumption of zero initial conditions. In case of nonzero initial conditions, the solution can be obtained entirely analogously. In conclusion it is noted that the

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solution (25) was obtained formally, without ascertaining its conditions of applicability. There are 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: E.P. Gross, Plasma oscillations in a static magnetic field. Phys. Rev., 1951, 82, no. 2, 232-242.

SUBMITTED: July 18, 1961

Card 6/6

39668
S/056/62/043/001/024/056
B104/B102

26.2340

AUTHORS: Dnestrovskiy, Yu. N., Kostomarov, D. P.

TITLE: Stability of plane electron beams in bounded systems with a decelerating electric field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 158 - 165

TEXT: The stability of steady-state solutions of the kinetic equations for a bounded system of charged particles is studied without making any assumption on the potential of an external field. The system consists of particles of one kind (electrons); the results may be well applied to a plasma. The stability problem proves to be equivalent to the problem of the existence of eigenvalues of a Fredholm integral equation with a kernel depending on a complex parameter. If this equation has no eigenvalues in the right-hand half-plane, the steady-state solutions will be stable; otherwise, they are unstable. The stability of steady-state solutions is derived with the aid of a criterion for the injection of an electron beam into the system: the function $E(p,x) - \int_0^1 K(p,x,\xi)E(p,\xi)d\xi$

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must not have eigenvalues in the right-hand half-plane. The kernel $K(p,x,\xi)$ is analytic with respect to p; $E(p,x)$ is the electric-field function. The steady-state solutions are stable if (1) the particles are not reflected by the decelerating field, and (2) the distribution function of the electrons of the injected beam is a monotonically decreasing function of the velocity.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: January 17, 1962

ACCESSION NR: AP4001832 S/0203/63/003/006/1079/1088

AUTHOR: Ivanov, V. I.; Kostomarov, D. P.

TITLE: Computation of electrical currents induced in the ocean by the $S_q$-variations of the geomagnetic field

SOURCE: Geomagnetizm i aeronomiya, v. 3, no. 6, 1963, 1079-1088

TOPIC TAGS: geophysics, marine hydrology, oceanic electric current, geomagnetism, geomagnetic field, field component, S sub q variation, Z component, geomagnetic marine current, telluric current, Pacific Ocean telluric current

ABSTRACT: Mathematical formulas, based primarily on the work of Price (Quart. Mech. and Appl. Math., 1949, v. 2, no. 3, 283) and Rikitake (J. Geomagn. and Geoelectric., 1960, v. 11, no. 3, 65) are derived for computing the electrical currents induced by long-period variations of the Z-component of the geomagnetic field in a hypothetical, spherically segmented ocean. In contrast to Rikitake's assumption that the distribution of currents and their magnetic field in the ocean are computed from known ionospheric magnetic potentials, the authors base

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ACCESSION NR: AP4001832

their computations on an assumed total field, i.e., the sum of the observed ionospheric and telluric current fields. These formulas are used to analyze the telluric currents in the Pacific Ocean and in a small inland sea and those around a small, hypothetical, round island. Orig. art. has: 8 figures and 32 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet, Fizicheskiy fakul'tet (Moscow State University, Faculty of Physics)

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S/109/63/008/003/006/027
D413/D308

AUTHORS: Dnestrovskiy, Yu. N., and Kostomarov, D. P.

TITLE: The diffraction of a plane electromagnetic wave on a circular plasma cylinder

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 3, 1963, 408-415

TEXT: The authors consider the diffraction of a plane electromagnetic wave on a circular plasma cylinder in the presence of a uniform external magnetic field parallel to the axis of the cylinder. A plasma with a blurred boundary is assumed, such that electrons are absent at points outside the cylinder, while, in its interior, the undisturbed electron distribution function is close to the Maxwellian. The case of normal incidents of a wave with an electric vector polarized along the cylinder axis is investigated. It is assumed that the mean Larmor radius of the electrons is much smaller than the radius of the cylinder and the wavelength and all the calculations are taken to an accuracy including the

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second order of small quantities. By making use of the known solution of the diffraction problem for a dielectric cylinder, the problem is reduced to an integral equation which is then solved by the method of successive approximations. It is observed that the method may be extended to solve the diffraction of waves with this polarization at a plasma cylinder of any form, provided a solution is available for the corresponding dielectric cylinder.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Faculty of Physics of the Moscow State University im. M. V. Lomonosov)

SUBMITTED: March 9, 1962

DNESTROVSKIY, Yu.N.; KOSTOMAROV, D.P.

Propagation of electromagnetic waves in a half-space filled with a plasma. Vest. Mosk. un. Ser. 3: Fiz., astron. 18 no.2: 3-8 Mr-Ap '63. (MIRA 16:6)

1. Kafedra matematiki Moskovskogo universiteta.
(Electromagnetic waves)
(Plasma (Ionized gases))

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SSD--Pi-4/Pab-4/Po-4--IJP(C)

ACCESSION NR: AP3000019 S/0057/63/033/005/0625/0626

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AUTHOR: Dnestrovskiy, Yu. N.; Kostomarov, D. P.

TITLE: Concerning the stability of weakly inhomogeneous plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 5, 1963, 625-626

TOPIC TAGS: stability of plasmas, inhomogeneous plasmas

ABSTRACT: The stability of a cold inhomogeneous plasma in a one-component magnetic and a one-component gravity field is investigated. The stability is investigated with respect to perturbations in the form of purely longitudinal plasma waves (rot E = 0) of frequency Omega. The point of departure is the dispersion equation involving the components of the dielectric constant tensor. Neglect of smaller terms leads to an expression cubic in Omega. Instability of the plasma with respect to a perturbation with a given wave vector is equivalent to the said equation having complex roots. If all the roots are real, the plasma will be stable. For small values of the parameter Beta characterizing the direction of propagation of the perturbing wave relative to the y-axis, long

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ACCESSION NR: AP3000019

waves are conducive to instability. For Beta equal zero there is obtained the instability condition for a wave propagating along the y-axis, found by Lehnert, B. (Phys. fluids, 4, 847, 1961). With increase of Beta the region of instability shifts to the side of shorter wavelengths. Orig. art. has: 7 equations.

ASSOCIATION: Fizicheskiy fakul'tet MGU (Physics Department, MGU)

SUBMITTED: 06Oct62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 000 OTHER: 001

lm/ja
Card 2/2

DNESTROVSKIY, Yu.N. (Moskva); KOSTOMAROV, D.P. (Moskva)

Stability of an inhomogeneous magnetized plasma. Zhur. vych. mat. i mat. fiz. 3 no.5:905-914 S-O '63. (MIRA 16:11)

L 18477-63 EWG(k)/EWT(l)/BDS/ES(w)-2 AFFTC/AFWL/ASD/ESD-3/IJP(C)/SSD
ACCESSION NR: AP3005501 Pz-4/Pi-4/Pab-4/Po-4 AT S/0057/63/033/008/0922/0928

AUTHOR: Dnestrovskiy, Yu. N.; Kostomarov, D. P.; Skry*dlov, N. V.

80

TITLE: Waves in a plasma near the cyclotron resonances

79

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 8, 1963, 922-928

TOPIC TAGS: plasma, dispersion, cyclotron resonance

ABSTRACT: The propagation of waves transversely to an external magnetic field in a plasma whose temperature is low compared with the electron rest energy is discussed on the basis of a relativistic dielectric tensor. The relativistic treatment is important at frequencies near harmonics of the cyclotron frequency, even at non-relativistic temperatures, for the non-relativistic dielectric tensor has singularities at these frequencies. The relativistic dielectric tensor employed is taken from work of B. A. Trubnikov (Sb. "Fizika plasmy* i problemy* termoyaderny*kh reaktsiy" 3, 104, 1958). The resonance portion of the tensor is expanded in powers of the ratio of the Larmor radius to the wavelength, and only the leading term is retained. Although this ratio becomes large in the non-relativistic case near the cyclotron resonances, it remains small in the relativistic case (at non-relativis-

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ACCESSION NR: AP3005501

tic temperatures) for electromagnetic waves and for one type of plasma wave. The retained portion of the dielectric tensor is put into a form suitable for computation and its behavior in the neighborhood of the cyclotron frequency and its first two harmonics is illustrated with graphs. The resonance term has an anti-Hermitian part (leading to absorption) only for frequencies below the resonance. Expressions are obtained for the refractive indices for the ordinary and the extraordinary electromagnetic waves and for the plasma wave having the smaller index. At the cyclotron frequency the extraordinary wave is much less strongly absorbed than the ordinary wave. The plasma wave having the larger refractive index violates the condition that the wavelength be large compared with the Larmor radius. A method of successive corrections is proposed for dealing with this case. An error is pointed out in a paper by A.A.Rukhadze and V.P.Silin (ZhTF, 32, 423, 1962). Orig.art. has: 36 formulas and 2 figures.

ASSOCIATION: Fizicheskiy fakul'tet MGU (Physics Department, MGU)

SUBMITTED: 02Jul62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 007 OTHER: 000

Card2/2

DNESTROVSKIY, Yu.N.; KOSTOMAROV, D.P.

Eigenvalue problems for second-order equations in the case of nonlinear dependence on the parameter $\lambda$. Dokl. AN SSSR 152 no.1:28-30 S '63. (MIRA 16:9)

1. Moskovskiy gosudarstvennyy universitet im. Lomonosova. Predstavleno akademikom I.G.Petrovskim.
(Boundary value problems) (Differential equations)

IVANOV, V.I.; KOSTOMAROV, D.P.

Calculation of the electric currents induced in the sea by the Sq-variation of the geomagnetic field. Geomag. i aer. 3 no.6: 1079-1088 N-D '63. (MIRA 16:12)

1. Moskovskiy gosudarstvennyy universitet, fizicheskiy fakul'tet.

ACCESSION NR: AP4024560 S/0208/64/004/002/0267/0277

AUTHOR: Dnestrovskiy, Yu. N. (Moscow); Kostomarov, D.P. (Moscow)

TITLE: Asymptotics of eigenvalues for not self-adjoint boundary problems

SOURCE: Zhurnal vy*chislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 2, 1964, 267-277

TOPIC TAGS: eigenvalue, not self adjoint boundary problem, boundary problem, second order differential equation

ABSTRACT: The boundary problem

$$\frac{d^2w}{dx^2} + k^2 Q(x, \lambda) w = 0,$$
$$w(+\infty, \lambda, k) = w(-\infty, \lambda, k) = 0,$$

is considered, where the parameter $\lambda$ enters nonlinearly. An asymptotic method is described for the approximate determination of the eigenvalues for large values of k (real). In the classical Sturm-Liouville problem, the equation for

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ACCESSION NR: AP4024560

the approximate determination of the eigenvalues for large k is:

$$\cos\left(k\int_{x_1(\lambda)}^{x_2(\lambda)}\sqrt{Q(t,\lambda)}\,dt\right)\cos\left(k\int_{x_3(\lambda)}^{x_4(\lambda)}\sqrt{Q(t,\lambda)}\,dt\right)\cdots=0.$$

It is shown that the approximating equation for the above problem has the same form. By imposing conditions on Q, the problem is carried to the complex plane. The investigation is based on the asymptotic behavior of the equation

$$d^2w/dz^2 + k^2 Q\ (z, \lambda)\, w = 0$$

for $k \to \infty$. Asymptotic formulas are obtained by considering a Volterra integral equation whose solutions satisfy the differential equation. The analysis depends on the topological structure of the level curves of the function Im $q(z, \zeta, \lambda)$ where

$$q(z,\zeta,\lambda)=\int_{\zeta}^{z}\sqrt{Q(t,\lambda)}\,dt.$$

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ACCESSION NR: AP4024560

This structure is determined by the distribution of zeros of the function $Q(z, \lambda)$. The results obtained are valid only for a particular distribution. Orig. art. has: 4 figures and 28 equations.

ASSOCIATION: none

SUBMITTED: 18Apr63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: MA NO REF SOV: 004 OTHER: 002

Card 3/3

L 25666-65 EWT(1)/EWG(k)/EPA(sp)-2/T/EPA(w)-2/EEC(t)/EWA(m)-2 Po-4/Pi-4/Pz-6/
[illegible] IJP(c) AT
ACCESSION NR: AP5001546 S/0188/64/000/006/0068/0074 53 39 B

AUTHOR: Kostomarov, D. P.

TITLE: Drift oscillations of inhomogeneous plasma propagating across an external magnetic field 21

SOURCE: Moscow. Universitet. Vestnik. Seriya 3. Fizika, astronomiya, no. 6, 1964, 68-74

TOPIC TAGS: plasma oscillation, inhomogeneous plasma, drift oscillation, external magnetic field, Larmor radius, Vlasov equation, Maxwell function, magnetic drift

ABSTRACT: Drift oscillations are considered in the case where the electric vector is polarized along the magnetic field (ordinary wave). Restrictions are placed on the Larmor radius with respect to other parameters so as to obtain a solution for the ordinary wave in inhomogeneous plasma, giving the permittivity, by solving the linearized Vlasov equations for electrons and ions. The Maxwell function is taken as the unperturbed function, with longitudinal and transverse temperature and density distributions. Perturbation theory is shown to be valid in solving the equation for inhomogeneous plasma. Two examples are then given to give a quantitative picture of the effect, and it is shown that magnetic drift

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L 25666-65
ACCESSION NR: AP5001546

2

can cause unstable oscillations with a small exponential increment. "The author thanks Yu. N. Dnestrovskiy for evaluating the results." Orig. art. has: 17 equations.

ASSOCIATION: Kafedra matematiki Moskovskogo Universiteta (Mathematics department, Moscow State University)

SUBMITTED: 25Dec63 ENCL: 00 SUB CODE: ME, MA

NO REF SOV: 002 OTHER: 002

Card 2/2

L 10735-65 EWT(d)/EWT(l)/EWO(k)/EPA(sp)-2/EEC(k)-2/EEC-4/EPA(w)-2/EEC(t)/T/ Pn-4/Po-4/Pg-4/Pt-10/Pi-4/Pl-4/Pz-6 IJP(c)/ESD/AFETR/ AEDC(b)/SSD/RAEM(a)/AEDC(s)/ESD(t)/AFWL AT/WS

ACCESSION NR: AP4046344 S/0057/64/034/010/1835/1842

AUTHOR: Kostomarov, D.P.

TITLE: Influence of particle drift on the propagation of the ordinary wave in a non-uniform plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.10, 1964, 1835-1842

TOPIC TAGS: plasma stability, inhomogeneous magnetic field, inhomogeneous plasma, plasma wave propagation

ABSTRACT: The effect of drift of electrons and ions on the propagation of the ordinary wave in a non-uniform plasma in a magnetic field is discussed. The applied magnetic field is assumed to be parallel to the z axis of a rectangular coordinate system and the strength of the applied field and the density of the plasma are assumed to be functions of x. Ordinary waves propagating in the y direction are treated. The dielectric constant was obtained by solving the linearized kinetic equations under the following simplifying assumptions: the spatial dispersion in the x direction is negligible; the non-uniformity of the plasma and the field is negligible over distances of the order of the Larmor radii; the frequency is small compared with the

L 10735-65
ACCESSION NR: AP4046344

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electron Larmor frequency; the electron Larmor radius is small compared with the wavelength; and the ratio of the kinetic to the magnetic pressure is small compared with unity and large compared with the ratio of the electron to the ion mass. The drift due to the inhomogeneity of the magnetic field (magnetic drift), and that due to the inhomogeneity of the plasma density (density drift) are both considered. High-frequency oscillations and drift oscillations are distinguished. In each case a simplified equation is derived for the amplitude of the ordinary wave as a function of x by dropping the ion terms in the dielectric constant and introducing other approximations peculiar to each case. A spectrum of real frequencies is determined by each of these equations together with the condition that the amplitude remain finite at infinity. The imaginary part of the frequency is calculated by perturbation theory. The frequency of the high frequency oscillations exceeds the electron Langmuir frequency. These waves have a discrete frequency spectrum only if the plasma density has a minimum, and under certain conditions the magnetic drift of the ions leads to instability. The drift oscillations have a discrete frequency spectrum, of which the greatest frequency is much less than the electron Langmuir frequency. The real part of the frequency of these oscillations is due primarily to density drift of electrons, and the imaginary part is due to magnetic drift of ions. The magnetic drift of the ions can lead to instability, particularly when the ion

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ACCESSION NR: AP4046344

2

temperature greatly exceeds the electron temperature. A specific example for which the results can be obtained in closed form is presented for each of the two types of oscillation. "The author expresses his deep gratitude to Yu.N.Dnestrovskiy for a discussion." Orig.art.has: 29 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet, Fizicheskiy fakul'tet (Moscow State University, Physics Department)

SUBMITTED: 15Sep63

ENCL: 00

SUB CODE: ME, EM

NR REF SOV: 004

OTHER: 002

3/3

L 7732-66 EWT(1)

ACC NR: AP5025877 SOURCE CODE: UR/0057/65/035/010/1713/1719

AUTHOR: Kostomarov, D.P. 44,55

ORG: Physics Department, Moscow State University im. M.V.Lomonosov (Moskovskiy gosudarstvennyy universitet, Fizicheskiy fakul'tet) 44,55

47
44B

TITLE: On plasma drift waves propagating transversely to an external magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 10, 1965, 1713-1719

TOPIC TAGS: nonuniform plasma, plasma magnetic field, plasma stability, plasma oscillation 21,44,55

ABSTRACT: The stability of plasma drift waves propagating transversely to an external magnetic field in an inhomogeneous plasma is discussed on the basis of the linearized equation of Vlasov for the distribution function perturbation. The plasma is assumed to be dense (ion Langmuir frequency much higher than the ion Larmor frequency) and to be inhomogeneous in only one dimension. The magnetic field is assumed to be perpendicular to the direction of the inhomogeneity and the waves are assumed to propagate transversely to both. The length D characterizing the plasma inhomogeneity is assumed to be much greater than the electron and ion Larmor radii. A differential equation for the electric potential is derived and reduced with the aid of different simplifying assumptions to different equations of the Sturm-Liouville type, the eigenvalues of which are approximated and discussed. The parameter $P = (f_i D/c)(1 + (T_e/T_i))^{1/2}$ plays

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L 21719-66 EWT(1)/ETC(f)/EPF(n)-2/EWG(m) IJP(c) GG/AT

ACC NR: AP6004876 SOURCE CODE: UR/0057/66/036/001/0039/0044

AUTHOR: Dnestrovskiy, Yu.N.; Kostomarov, D.P. 71

ORG: Physics Department, MGU (Fizicheskiy fakul'tet MGU) 69

TITLE: Probing of a plasma with electromagnetic waves 21, 44, 55 21, 44, 55 B

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 1, 1966, 39-44

TOPIC TAGS: plasma diagnostics, plasma density, electromagnetic wave reflection, phase shift, external magnetic field, Volterra equation

ABSTRACT: This paper is concerned with determining the density of a plasma 9M in an external magnetic field as a function of distance from the surface by measuring the phase shifts on reflection of normally incident electromagnetic waves of different frequencies. The problem of calculating the density as a function of depth from the measured phase shift as a function of frequency is treated in the geometric optics approximation for the two cases in which the magnetic field is perpendicular or parallel, respectively, to the plasma - vacuum boundary. When the magnetic field is perpendicular to the plasma boundary the problem reduces to the solution of a Volterra integral equation of the first kind of the Abel type, and the solution can be expressed as a quadrature. When the ordinary wave is employed for probing, phase shifts are required at low frequencies where, unless the plasma density is high and the magnetic field is weak, the geometric optics approximation is no longer valid. When the extra-

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L 21719-66

ACC NR: AP6004876

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ordinary wave is employed, phase shifts are not required at frequencies below the Larmor frequency. When the magnetic field is parallel to the plasma boundary the problem again reduces to the solution of a Volterra integral equation of the first kind which, however, is of the Abel type only for the case when the ordinary ray is employed for probing. It is proposed that the integral equation relating plasma density and phase shift of the extraordinary ray be solved numerically by the regularization technique of A.N.Tiknonov (DAN SSSR, 151, No.3, 501, 1963). Artificial problems were solved in this way to test the accuracy and stability of the technique, and some of the results are presented graphically. It is shown that 20% errors in measuring the phase shifts result in approximately 10% errors in the calculated plasma densities. Use of the extraordinary wave has the same advantages in the case of a parallel magnetic field as in the case of a perpendicular field. The authors thank A.N.Kharkov and V.I. Pistunovich for discussions. Orig. art. has: 17 formulas and 3 figures.

SUB CODE: 20/ SUBM DATE: 11Jan65/ ORIG REF: 006/ OTH REF: 000

Card 2/2 dda

L 29676-66 EWT(1)/ETC(f) IJP(c) AT

ACC NR: AP6012916 SOURCE CODE: UR/0020/66/167/005/1032/1034

AUTHOR: Dnestrovskiy, Yu. N.; Kostomarov, D. P. 48

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet) B

TITLE: Flute instability in an uncompensated plasma

SOURCE: AN SSSR. Doklady, v. 167, no. 5, 1966, 1032-1034

TOPIC TAGS: plasma instability, plasma research, plasma stabilization, electric field

ABSTRACT: The authors have investigated the influence of the plasma proper electric fields on the plasma stability, starting with a second-order differential equation for the plasma potential, first derived by M. N. Rosenbluth and N. Simon. (Phys. Fluids v. 8, No. 7, 1300, 1965). The differential equation is solved by the Galerkin method and a solution is obtained in the form of a series of basis functions. An estimate is presented for the value of the dimensionless distance at which the plasma becomes unstable. It is shown that a uniform electric field causing drift in a plasma as a whole, does not give rise to instability, which arises only when individual layers of the plasma move relative to one another.

Card 1/2 UDC: 533.9

Card 2/2 LC

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000825220014-7

ACC NR: AT6034337 SOURCE CODE: UR/0000/66/000/000/0060/0067

AUTHORS: Dnestrovskiy, Yu. N. (Moscow); Kostomarov, D. P. (Moscow)

ORG: none

TITLE: Application of Galerkin method to the solution of nonhomogeneous plasma stability problems

SOURCE: Chislennyye metody resheniya zadach matematicheskoy fiziki (Numerical methods of solving problems in mathematical physics); sbornik statey. Moscow, Izd-vo Nauka, 1966, 60-67

TOPIC TAGS: nonhomogeneous plasma, magnetic trap, plasma wave, numeric solution, complex function

ABSTRACT: The problem of nonhomogeneous plasma stability, relative to drift oscillations of ordinary waves, is analyzed. The plasma is assumed to be nonhomogeneous along the x-axis and is in a plane-parallel magnetic field H = (0,0,H(x)). The electron-cyclotron frequency is assumed to be much smaller than the characteristic plasma dimension along x, and the thermodynamic pressure is much less than the magnetic pressure. The ordinary wave drift oscillation equation is given by

$$L[E] = E'' - k^2E + \frac{\omega^2}{c^2}\varepsilon E = 0,$$

with finite conditions at infinity, or

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APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000825220014-7

$$|E(-\infty)| < \infty, \quad |E(+\infty)| < \infty.$$

Under the above assumptions the term $\varepsilon_e E$ is expressed by

$$\varepsilon_e E = -E(x)\frac{\omega_{0e}^2}{\omega^2}\int_0^\infty \frac{\omega n_e(x) - (n_e'(x)\tau_e(x) + n_e(x)\tau_e'(x)\sigma)(T_{0e}k/m_e\omega_e)}{\omega - kv_e(x)\tau_e(x)\sigma} e^{-\sigma}d\sigma.$$

To solve the above equation, the Galerkin method is applied where the electric field is given by

$$E(x) = \sum_{n=n_1}^{n_2} C_n E_n(x).$$

This leads to the classical Sturm-Liouville problem which is analyzed in the complex plane. As an illustration, the following simple example is considered

$$N_i(x) = \frac{N_1 e^{x/x_0} + N_2}{e^{x/x_0} + 1} \qquad (N_2 > N_1),$$

$$T_e(x) = T_{0e} = \text{const}, \qquad T_i(x) = T_{0i} = \text{const}.$$

It is shown that the Galerkin method satisfies convergence requirements. Orig. art. has: 20 equations and 6 figures.

SUB CODE: 20/ SUBM DATE: 24Mar65/ ORIG REF: 006

12/

Card 2/2

FEDIN, K.A.; BAYEVSKIY, D.A., doktor istor.nauk; VOLKOV, N.S., doktor istor.nauk; GENKINA, E.B., doktor istor.nauk; KUCHKIN, A.P., doktor istor.nauk; KOSTOMAROV, G.D., prof.; DADYKIN, R.P., kand. istor.nauk; ROGACHEVSKAYA, ~~L.S.,~~ kand.istor.nauk; SHABALIN, B.I., kand.istor.nauk; MAMONTOV, I.S.; PIROGOV, V.K., prepodavatel'

Let's write the history of our plants and factories; a letter to the editors. Sov.profsoiuzy 16 no.7:62-63 Ap '60.
(MIRA 13:4)

1. Sekretar' Soyuza pisateley SSSR (for Fedin). 2. Glavnyy redaktor izd-va "Moskovskiy rabochiy" (for Mamontov).
(Factories)

GUBKO, I.T.; SIZOV, I.D.; KOSTOMAROV, M.I.; KHITKO, Ye.V.

Mixing dinas raw materials in model I15 centrifugal pug mills. Ogneupory 28 no.6:245-249 '63. (MIRA 16:6)

1. Pervoural'skiy dinasovyy zavod.
(Refractory materials)
(Mixing machinery)

KHITRO, Ye.V.; KOSTOMAROV, M.I.; OSTAPCHUK, L.I.

Rapid method of detecting $Fe_2O_3$ in a calcarous-iron compound.
Ogneupory 25 no.5:237-238 '60. (MIRA 14:5)

1. Pervoural'skiy dinasovyy zavod.
(Iron oxides--Analysis) (Pyrites--Analysis)

D'YACHKOV, P.N.; PURGIN, A.K.; BOL'SHAKOV, I.P.; GUBKO, I.T.;
KOSTOMAROV, M.I.; SIZOV, I.D.

Refractory Dinas material. Ogneupory 26 no.9:394-398 '61.
(MIRA 14:9)

1. Vostochnyy institut ogneuporov (for D'yachkov, Purgin, Bol'shakov). 2. Pervoural'skiy dinasovyy zavod (for Gubko, Kostomarov, Sizov).

(Refractory concrete)

GUBKO, I.T.; SI[illegible]OV, I.D.; KOSTOMA[illegible]OV, M.I.; YALOV[illegible], G.I.

Dust removal during the manufacture of dinas brick and making use of the trapped dust. Ogneupory 29 no.9:385-387 '64. (MIRA 17:10)

1. Pervoural'skiy dinasovyy zavod.

KOSTOMAROV, M.I.; TATARCHENKOV, P.S.; TOKAREV, A.I.

Automatic proportioning device for mineralizing additions.
Ogneupory 29 no.10:440-442 '64. (MIRA 18:7)

1. Pervoural'skiy dinasovyy zavod.

KOSTOMAROV, V.

I.P.Alymov' method of streamlining ships. Mor. i rech.flot 14 no.5:31-32 My '54. (MLRA 7:7)
(Shipbuilding)

KOSTOMAROV, V., kand.tekhn.nauk (Gor'kiy)

Constructing antilandslide structures in Gorkiy. Zhil.-kom.khoz. 10 no.4:17-19 '60. (MIRA 13:6)
(Gorkiy--Landslides) (Embankments)

KOSTOMAROV, V., kand.tekhn.nauk

Engineering protection of cities. Zhil.-kom. khoz. 12 no.10:8-9 O '62. (MIRA 16:2)

(Civil engineering)

1. SHALYT, M. S.; KOSTOMAROV, V. M.,

2. USSR (600)

4. Landscape Gardening - Donets Basin

7. Experimental landscaping of the Donets Basin coal dumps, Dop. AN URSR No. 5, 1950.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953. Uncl.

KOSTOMAREV, V. M.

KOSTOMAREV, V. M., Docent. Cand. Tekh. Sci.

"Modelling of Suspended Alluvium in Circulation Systems," abstracted in Gidrotekh. stroi., Nos. 5/6, pp. 28-29, 1946.

Chair of Hydraulics and Hydropower, MEI

KOSTOMAROV, V.M.; BURGVITS, A.G.

[N.P.Petrov, originator of the theory of hydrodynamic friction in machinery] Osnovopolozhnik teorii gidrodinamicheskogo treniia v mashinakh N.P.Petrov. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1952. 210 p. (MLRA 6:8)

(Petrov, Nikolai Pavlovich, 1836-1920) (Friction)

1. KOSTOMAROV, V. M., BURGVITS, A. G.

2. USSR (600)

4. Lubrication and Lubricants

7. On the Russian priority in establishing the theory of hydrodynamic friction in machines. Vest mash No. 9 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

1. KOSTOMAROV, V. M.

2. USSR (600)

4. Kuz'minskii, Pavel Dmitrievich, 1840-1900

7. High speed, tetrahedral-shaped vessel designed by P. D. Kuz'minskiy.
Rech. transp. 12 No. 5, 1952.

9. <u>Monthly List of Russian Accessions</u>, Library of Congress, <u>January</u> 1953. Unclassified.

KOSTOMAROV, V.M.

KOLCHIN, B.A.; ARTSIKHOVSKIY, A.V., doktor istoricheskikh nauk, professor, retsenzent; KOROLEV, A.V., kandidat tekhnicheskikh nauk, retsenzent; KOSTOMAROV, V.M., kandidat tekhnicheskikh nauk, redaktor.

[Metalworking techniques in ancient Russia] Tekhnika obrabotki metalla v drevnei Rusi. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 158 p. (MLRA 7:6)
(Metalwork)

KOSTOMAROV, V.M., kandidat tekhnicheskikh nauk.

On the Russian priority in establishing a general physical theory of laminar flow. Gidr.i mel. 5 no.5:3-13 My '53. (MLRA 6:6)
(Hydrodynamics)

KOSTOMAROV, V.M.; POKROVSKIY, Yu.M., kandidat tekhnicheskikh nauk, retsenzent; KOMAROV, L.P., inzhener, redaktor; STUPIN, A.K., redaktor izdatel'stva; UVAROVA, A.F., tekhnicheskiy redaktor

[Activities of the Russian Engineering Society in promoting machinery manufacture] Iz deiatel'nosti Russkogo tekhnicheskogo obshchestva v oblasti mashinostroeniia. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1957. 177 p. (MLRA 10:7)

Mechanical engineering--History)

DAVIDYANTS, Nikita Mikhaylovich; KARAGODIN, Artem Leonidovich; KARAGODIN, Vladimir Leonidovich; KOSTOMAROV, V.M., red.; CHURINOV, A.I., red. izd-va; LELYUKHIN, A.A., tekhn. red.

[City drainage systems; design and construction] Gorodskie vodostoki; proektirovanie i stroitel'stvo. Moskva, Izd-vo M-va kommun. khoz. RSFSR, 1961. 181 p. (MIRA 14:11)

(Sewerage)

GRATSIANSKIY, M.N., kand. tekhn. nauk; ~~KOSTOMAROV, V.M.,~~ kand. tekhn. nauk; ALEKSANDROVSKIY, Yu.V., kand. tekhn. nauk; KARAGODIN, V.L., inzh.; KARAGODIN, A.L., inzh.; ANUFRIYEV, V.Ye., kand. tekhn. nauk; KURDYUMOV, M.D., inzh.; DZHUNKOVSKIY, N.N., doktor tekhn. nauk, prof.; ABRAMOV, S.K., kand. tekhn. nauk; KEDROV, V.S., kand. tekhn. nauk; GIBSHMAN, Ye.Ye., prof., red.; YEGOROV, P.A., inzh., red.; VARGANOVA, A.N., red. izd-va; LELYUKHIN, A.A., tekhn. red.

[Manual for the design, construction and operation of urgan roads, bridges and hydrotechnical structures] Spravochnik po proektirovaniiu, stroitel'stvu i ekspluatatsii gorodskikh dorog, mostov i gidrotekhnicheskikh sooruzhenii. Red. kol. E.E. Gibshan, N.N.Dzhunkovskii, P.A.Egorov. Moskva, Izd-vo M-va kommun.khoz. RSFSR. Vol.2. [Hydrotechnical structures] Gidrotekhnicheskie sooruzheniia. Red. toma: N.N.Dzhunkovskii, M.D.Kurdiumov. 1961. 706 p. (MIRA 15:3)
(Hydraulics) (Hydraulic engineering)

KOSTOMAROV, Vadim Mikhaylovich; NERONOVA, M.D., red. izd-va; KHENOKH, F.M., tekhn. red.

[Streams, ponds and reservoirs in cities] Gorodksie vodoemy. Moskva, Izd-vo M-va kommun. khoz. RSFSR, 1961. 63 p. (MIRA 15:4)

(Hydraulic engineering) (Municipal engineering)

KOSTOMAROV, V.N.; GURLEVA, S.I.; CHURIKOVA, E.K.

Protecting veneer raw material from cracking and decay. Der. prom. 12 no.10:21-23 0 '63. (MIRA 16:10)

SLUKHAY, S.I.; KOSTOMAROV, V.N.; VLASYUK, P.A., diysnyy chlen.

Effect of potassium permanganate on seed germination and early growth of certain species of trees. Dop.AN URSR no.4:289-294 '52. (MLRA 6:10)

1. Akademiya nauk Ukrayins'koyi RSR (for Vlasyuk). 2. Instytut lisivnytstva Akademiyi nauk Ukrayins'koyi RSR (for Slukhay and Kostomarov).

(Trees) (Germination)

KOSTOMAROV, V. N.

"The Root Systems of Pine and Oak Trees in the Young Semiforests of the Ukrainian 'Poles.'" Cand Agr Sci, Khar'kov Order of Labor Red Banner Agricultural Inst imeni V. V. Dokuchayev, Min Higher Education USSR, Kiev, 1954. (KL, No 9, Feb 55)

SO: Sum. No. 631, 26 Aug 55-Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (14)

KOSTOMAROVA, A.A.

Development of the secreting and absorbing apparatus of a chick's digestive tract during the incubation. Dokl. AN SSSR 111 no.3:720-722 N '56. (MLRA 10:2)

1. Institut morfologii zhivotnykh imeni A.N. Severtsova Akademii nauk SSSR. Predstavleno akademikom I.I. Shmal'gauzenom.
(EMBRYOLOGY--BIRDS) (DIGESTIVE ORGANS)

17(4)

AUTHOR: Kostomarova, A. A. SOV/20-125-4-71/74

TITLE: The Development of Intestine in Cultural Carpio During Feeding and Starvation in the Stage of Mixed Nutrition (Razvitiya kishechnika kul'turnogo karpa pri kormlenii i golodanii na etape smeshannogo pitaniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 4, pp 941-944 (USSR)

ABSTRACT: Structural characteristics of the intestine of fish are directly related to the character of their nutrition. The relative length of the intestine of adult fish is connected with their type of food (Ref 1). As the lack of appropriate food during the early stages of the larval period may considerably endanger the stocks of fish, food and connected problems in Teleostae are of great interest. However, the problem mentioned in the title has not yet been duly elucidated in publications (the author only knows of Ref 6). This paper aimed at ascertaining the differentiating character of the intestine in cultural Carpio as well as the reversibility of the changes caused by starvation. The embryos and larvae of the carp were divided into two groups: controls and experimental group. On figures 1

SOV/20-125-4-71/74

The Development of Intestine in Cultural Carpio During Feeding and Starvation in the Stage of Mixed Nutrition

and 2 the changes of diameter of the intestine may be seen. On the basis of the observations made the author draws the following conclusions: 1) The presence of external food during the stage of mixed nutrition leads to a normal development of visceral laminae and of cup-shaped cells in the intestine. The lack of normal food results in an insufficient development of these laminae and degeneration of the cup-shaped cells. 2) The above mentioned changes in the intestine of larvae of cultural Carpio are reversible and gradually disappear if the larvae are subsequently fed. There are 2 figures and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut morfologii zhivotnykh im. A. N. Severtsova Akademii nauk SSSR (Institute of Animal Morphology imeni A. N. Severtsov of the Academy of Sciences USSR)

PRESENTED: December 23, 1958, by A. N. Bakulev, Academician

SUBMITTED: December 17, 1958

Card 2/2

KOSTOMAROVA, A. A., Cand Biol Sci -- "Effect of starvation during [redacted] early stages of the larval period of development of bony fishes." Mos, 1961 (Acad Sci USSR. Inst of Morphology of Animals im A. N. Severtsev). (KL, 4-61, 192)

KOSTOMAROVA, A.A.

Significance of the stage of mixed feeding for the survival of pike larvae. Trudy sov. Ikht. kom. no.13:344-347 '61.
(MIRA 14:8)

1. Institut morfologii zhivotnykh AN SSSR.
(Pike) (Larvae--Fishes) (Fishes--Food)

KOSTOMAROVA, A.A.

Effect of starvation on the development of the larvae of bony fishes. Trudy Inst. morf. zhiv. no.40:4-77 '62.
(MIRA 16:6)

(Starvation) (Teleostei)
(Larvae--Fishes)

TERNOVSKIY, S.D.; VOROKHOBOV, L.A.; KOSTOMAROVA, G.A. (Moskva).

"Fractures in children [in German] by W. Blount. Reviewed by S.D. Ternovskii, L.A. Vorokhobov, G.A. Kostromarova. Ortop. travm. protez., Moskva 19 no.6:85-86 N-D '58. (MIRA 12:1)
(FRACTURES)

VOROKHOBOV, L.A.; KOSTOMAROVA, G.A.

Diagnosis and clinical aspects of acute appendicitis in infants. Pediatriia 41 no.5:65-70 My '62. (MIRA 15:5)

1. Iz kliniki detskoy khirurgii (zav. - chlen-korrespondnet AMN SSSR prof. S.D. Ternovskiy [deceased]) II Moskovskogo meditsinskogo instituta imeni N.I. Pirogova i Detskoy bol'nitsy imeni N.F. Filatova (glavnyy vrach L.A. Vorokhobov).
(APPENDICITIS)

KOSTOMAROVA, M.A.; BOGDANOV, I.F.

Calculation method for processing the results of synthesis from carbon monoxide and steam. Trudy IGI 16:51-58 '61. (MIRA 16:7)
(Carbon monoxide) (Steam) (Chemistry, Organic--Synthesis)

KOSTOMAROVA, M.A.; BOGDANOV, I.F.

Study of synthesis from carbon monoxide and water vapor on an iron catalyst. Khim.i tekh.topl.i masel 6 no.1:19-25 Ja '61. (MIRA 14:1)

1. Institut goryuchikh iskopayemykh AN SSSR.
(Carbon monoxide) (Water vapor) (Catalysts)

MAL'CHONKOVA, A.S., inzh.; KOSTOMAROVA, S.I.; DENISOVA, N.G.; DIKIKH, L.S.; NEDORUBOV, Ye.Ye.; SHVYRKINA, R.P., udarnik kommunisticheskogo truda; VANYUSHIN, M.S.

Widen the movement of shock workers and collectives of communist labor in regional offices and village communication departments. Vest. sviazi 20 no.9:25-28 S'60. (MIRA 13:10)

1. Mytishchinskaya avtomaticheskaya telefonnaya stantsiya (for Mal'chonkova). 2 Nachal'nik L'vovskogo otdeleniya svyazi Podol'skogo rayona, Moskovskoy oblasti (for Kostomarova). 3 Ispolnyayushchiy obyazannosti inzhenera Lyublinskoy avtomaticheskoy telefonnoy stantsii (for Denisova). 4. Nachal'nik Tushinskoy kontory svyazi (for Dikikh). 5. Nachal'nik 3-go otdeleniya svyazi Noginska (for Nedorubov). 6. Ekspeditor Shchelkovskoy kontory svyazi (for Shvyrkina). 7. Nachal'nik Serpukhovskogo usilitel'nogo punkta (for Vanyushin).
(Telecommunication--Employees)
(Socialist competition)

84883

S/079/60/030/010/025/030
B001/B066

11.1170

AUTHORS: Vasil'yev, S. V., Zhuravleva, A. A., Kostomarova, V. L., and Vasil'yev, G. S.

TITLE: Effect of Nitrogen on Dibenzal Acetone

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 10, pp. 3414 - 3416

TEXT: Proceeding from the reaction of nitrogen tetroxide with unsaturated aliphatic ketones, one of the authors (Ref.1) showed that, according to the structure of the initial ketone, addition products are obtained which differ as to nature and properties. The nitro group was found to be added to the least, and the ONO group to the most strongly hydrogenated carbon atom. When treating benzal acetone with nitrogen tetroxide, not only an addition to the double bond of the side chain takes place, but also a substitution of the hydrogen of the benzene ring in the para position. The behavior of dibenzal acetone toward nitrogen tetroxide was investigated. Dibenzal acetone dissolved in ether was treated with gaseous and liquid reagents. The nitrite of nitro

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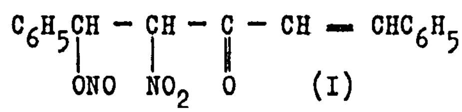
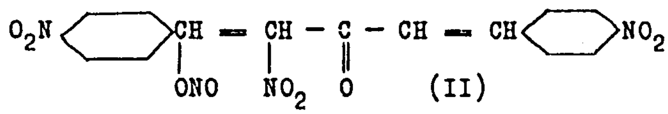
oxyketone (I) resulted in the former case, and the nitrite of trinitro oxyketone (II) in the latter.



(I)



(II)

By agitating with water, hydroxyl was substituted for the ONO group in both products (Refs.2 and 3), to give the corresponding crystalline hydroxy-nitro-ketones. The addition products decomposed when heated with water or mineral acids on the water bath for 28-30 hours (Refs. 4 and 5). There are 5 references: 3 Soviet, 1 US, and 1 British.



APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000825220014-7"

84883

Effect of Nitrogen on Dibenzal Acetone S/079/60/030/010/025/030
B001/B066

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology)

SUBMITTED: March 16, 1959

Card 3/3

VASIL'YEV, S.V.; LAPSHINA, S.N.; KOSTOMAROVA, V.L.

Fatty oil from Peucedanum ruthenicum. Zhur.prikl.khim. 38 no.9:2121-2123 S '65. (MIRA 18:11)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

TROYANOV, I. A.; OKSENGENDLER, G. M.[deceased]; KOSTOMAROVA, Ye. F.

Preparation of thioindigoid dyes by sulfuration of acetylnaphthalenes. Ukr. khim. zhur. 28 no.3:367-370 '62.
(MIRA 15:10)

1. Rubezhanskiy filial Nauchno-issledovatel'skogo instituta poluproduktov i krasiteley.

(Acetonaphthone) (Sulfuration)
(Thioindigo)

KOSTOMLATSKA, M.; NOVAK, J.

Mutual influencing of cultures of pyogenic cocci. Cesk. derm. 40 no.5:310-312 O '65.

1. I. dermato-venerologicka klinika fakulty vseobecneho lekarstvi Karlovy University v Praze (prednosta prof. dr. J. Konopik, DrSc.).

KOSTIN, A. K.

KOSTIN, A. K. --"Investigation of the Effect of the Principal Parameters that Determine the Operating Conditions of an Engine on the Heat Stresses in the Piston." *(Dissertations for Degrees in Science and Engineering Defended at USSR Higher Educational Institutions) Min of Higher Education USSR, Leningrad Polytechnic Inst imeni M. I. Kalinin, Leningrad, 1955

SO: Knizhnaya Letopis', No. 25, 18 Jun 55

* For Degree of Candidate in Technical Sciences

KOSTIN, A.K.

Determining the thermal state of the piston of a working cylinder in an internal combustion engine. Trudy LPI no.187:148-157 '56. (MIRA 13:6)

(Gas and oil engines)

KOSTIN, A.K.

Temperature of an uncooled piston depending on its structural features. Trudy LPI no.193:180-190 '58. (MIRA 12:2)
(Pistons)

Kostin A.K.

PHASE I BOOK EXPLOITATION SOV/3909

Leningrad. Politekhnicheskiy institut

Energomashinostroyeniye (Power-Machinery Construction) Moscow, Mashgiz, 1960. 163 p. (Series: Its: Trudy, No. 204) Errata slip inserted. 1,600 copies printed.

Sponsoring Agency: RSFSR. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya.

Resp. Ed.: V.S. Smirnov, Doctor of Technical Sciences, Professor; Ed.: V.I. Bulanin, Candidate of Technical Sciences, Docent; Tech. Ed.: P.S. Frumkin; Managing Ed. for Literature on the Design and Operation of Machinery (Leningrad Division, Mashgiz): F.I. Fetisov, Engineer.

PURPOSE: This book is intended for workers at scientific research institutes and factory design offices. It may also be useful to students of advanced courses and aspirants specializing in power-machinery construction.

COVERAGE: This collection of 17 articles deals with analyses of gas-turbine installations and theoretical and experimental investigations of the operation of power and transportation machinery, including turbines, compressors, and internal-combustion engines. A description is given of recent theoretical and experimental investigations undertaken by the Department of Power-Machinery Construction, Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute). The investigations include analyses of parameters for insuring high economy of operation and the perfecting of methods of calculating and designing new power equipment. References follow several of the articles.



AVAILABLE: Library of Congress

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Card 5/5

YAKOVLEVA, Ye.F.; SMIRNOVA, A.V.; KOSTONOGOV, V.G.

Phase analysis of Fe-Ni-Cr and Fe-Ni-Cr-Mo alloys. Sbor.trud. TSNIICHM no.31:121-128 '63. (MIRA 16:7)

(Iron-nickel-chromium alloys—Metallography)
(Electrochemical analysis)
(Phase rule and equilibrium)

KOSTON'YAN, A. YA

IVANOV, Anatoliy Aleksandrovich; KOSTON'YAN, A.Ya., otvetstvennyy red.; BEKKER, O.G., tekhn.red.; ALADOVA, Ye.I., tekhn.red.

[Automatization of mine hoisting machinery with asynchronous drive] Avtomatizatsiia shakhtnykh pod'emnykh mashin s asinkhronnym privodom. Moskva, Ugletekhizdat, 1957. 306 p. (MIRA 11:1)

(Hoisting machinery) (Automatic control)

KOSTON'YAN, A.YA.

MIKHEYEV, Yuriy Aleksandrovich,; KOSTON'YAN, A.Ya., otv. red.; KAUFMAN, A.M., red. izd-va,; ALADOVA, Ye.I., tekhn. red.

[Electricity in mining] Novye raboty v oblasti gornoi elektrotekhniki. Moskva, Ugletekhizdat, 1958. 97 p. (MIRA 11:12)
(Electricity in mining)

BUBLIKOV, Yevgeniy Vladimirovich, inzh.; DOKUKIN, Oleg Semenovich, inzh.; TELEPNEV, Dmitriy Yakovlevich, inzh.; FEDOROV, Georgiy Dmitriyevich, inzh.; FEDOROV, Sergey Vasil'yevich, inzh.; KOSTON'YAN, A.Ya., otv.red.; SABITOV, A., tekhn.red.

[Hoisting equipment in mine building] Pod"emnye ustanovki v shakhtnom stroitel'stve. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 258 p. (MIRA 13:5)

1. Ukrainskiy nauchno-issledovatel'skiy institut organizatsii i mekhanizatsii shakhtnogo stroitel'stva (UkrNIIOMShS) (for all, except Koston'yan, Sabitov).
(Mine hoisting--Equipment and supplies)

ONISHCHENKO, Pavel Nikiforovich; KOVAL', P.V., otv. red.; KOSTON'YAN, A.Ya., red.; MAKSIMOVA, V.V., tekhn. red.

[Mining machinery] Gornoprokhodcheskie mashiny i mekhanizmy. Moskva, Gosgortekhizdat, 1961. 270 p. (MIRA 15:8)
(Mining machinery)

ACC NR: AP6036907 (N) SOURCE CODE: UR/0226/66/000/011/0089/0092

AUTHOR: Korniyenko, P. A.; Kostornov, A. G.; Pugin, V. S.

ORG: Institute of Problems of Material Science, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Method of manufacturing large porous wall pipes

SOURCE: Poroshkovaya metallurgiya, no. 11, 1966, 89-92

TOPIC TAGS: stainless steel, pipe, porosity, metal joining, powder metal sintering

ABSTRACT: A process for joining large porous stainless-steel pipes into longer sections and for joining Kh17N2 cast stainless-steel flanges and end plates to pipe ends has been developed. Extruded (100 x 90 mm) pipes 400—450 mm long are joined into sections up to 2 m long by sintering using cementing paste containing carbonyl nickel powder and glycerin. The sintering is done at 1000C for 1 hr. A section up to 2 m long has a filtering area about 0.628 $m^2$ which can be used for filtration of aggressive gas media. Sintered joints have a porous structure with pores smaller than in sintered pipes. The joints ensure satisfactory rigidity and strength of sintered parts. Orig. art. has: 3 figures.

SUB CODE: 13/ SUBM DATE: 21Mar66/ ORIG REF: 004/

Card 1/1

KOSTORNOV, A.G.

Determining the time needed for reaching a given temperature under a refractory layer during sintering in various gaseous media. Porosh. met. 5 no.5:76-81 My '65.

(MIRA 18:5)

1. Institut problem materialovedeniya AN UkrSSR.

L 45300-66 EWT(d)/EWP(e)/EWT(m)/EWP(w)/EWP(t)/ETI/EWP(k) IJP(c) JD/EM

ACC NR: AP6020957 SOURCE CODE: UR/0226/66/000/006/0011/0012

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B

AUTHOR: Raychenko, A. I.; Kostornov, A. G.

ORG: Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN USSR)

TITLE: Rheological investigations of a plasticized powder charge

SOURCE: Poroshkovaya metallurgiya, no. 6, 1966, 11-12

TOPIC TAGS: powder metal, viscosimeter, plasticized powder charge, plastic viscosity

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ABSTRACT: Rheological investigations have shown that a plasticized powder charge behaves like a viscoplastic body under conditions of flow from a-capillary viscosimeter. It has been found that, due to drying, the yield point and plastic viscosity increase with the increase in density of the charge. The values of plastic viscosity

Card 1/2

L 45300-66

ACC NR: AP6020957

have been estimated. Orig. art. has: 3 figures and 1 table. [Based on authors' abstract] [NT]

SUB CODE: 11/ SUBM DATE: 28Nov65. ORIG REF: 002/

Card 2/2

L 33147-66 EWT(m)/EWP(e)/EWP(j)/EWP(k)/EWP(t)/ETI IJP(c) JD/HW/RM

ACC NR: AP6015349 (N) SOURCE CODE: UR/0226/66/000/005/0024/0028

AUTHOR: Fedorchenko, I. M.; Kostornov, A. G.

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B

ORG: Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN USSR)

TITLE: Investigation of the properties of materials obtained by extrusion and sintering of plasticized powder mixtures

SOURCE: Poroshkovaya metallurgiya, no. 5, 1966, 24-28

TOPIC TAGS: porosity, copper, tensile strength, powder metal sintering, metal extrusion, nickel, copper, carbon, plasticizer

ABSTRACT: The results of an investigation are presented for sintering porous samples obtained by extrusion of carbonyl nickel and electrolytic copper powders in a mixture with an organic plasticizer. Data are given on the shrinkage, tensile strength, and porosity of samples for comparison with the theoretical and experimental results obtained on highly porous compacts and loose powder samples. Orig. art. has: 5 figures and 1 table. [Based on author's abstract.] [AM]

SUB CODE: 11/ SUBM DATE: 15Dec65/ ORIG REF: 011/ OTH REF: 001

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